

CLAIMS

1. A foil bearing for supporting a rotating member that rotates about an axis, comprising:

5 a stationary mount member spaced from the rotating member so that a gap is defined between the stationary mount member and the rotating member, the stationary mount member having a first surface facing the rotating member and a second surface opposite to the first surface;

a moveable member disposed on a side of the stationary mount member
10 opposite to the rotating member so as to be rotatable about the axis, the moveable member having a first surface facing the second surface of the stationary mount member;

a first foil disposed in the gap between the rotating member and the stationary mount member to support the rotating member via a fluid film when the rotating
15 member rotates, the first foil having a portion extending in a substantially circumferential direction; and

an abutting member extending from the moveable member toward the first foil through a through-hole formed in the stationary mount member, the abutting member having one end in contact with the first surface of the moveable member and other end
20 facing the circumferentially extending portion of the first foil,

wherein a cam surface is formed on a part of the first surface of the moveable member with which the one end of the abutting member is in contact so that rotation of the moveable member around the axis can vary a length of the other end portion of the abutting member projecting out from the first surface of the stationary mount member
25 toward the circumferentially extending portion of the first foil.

2. A foil bearing according to claim 1, comprising a plurality of the first foils arranged in the circumferential direction of the rotating member, and at least one of the plurality of first foils is allotted with the abutting member.

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3. A foil bearing according to claim 2, each of the plurality of first foils is allotted with the abutting member.

4. A foil bearing according to claim 1, comprising a plurality of the abutting
10 members having varying lengths.

5. A foil bearing according to claim 1, comprising a plurality of the abutting members wherein a plurality of the cam surfaces are provided on the first surface of the moveable member corresponding to the plurality of abutting members, the plurality of
15 first cam surfaces having varying levels.

6. A foil bearing according to claim 2, wherein spaces between adjacent ones of the plurality of first foils are varied.

20 7. A foil bearing according to claim 1, wherein the rotating member comprises a shaft having a substantially cylindrical portion, and the stationary mount member surrounds the shaft so that the gap is formed as an annular gap defined between a cylindrical surface of the cylindrical portion of the shaft and the stationary mount member.

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8. A foil bearing according to claim 7, wherein the shaft consists of a rotor shaft of a gas turbine engine, and the foil bearing constitutes a journal bearing for the rotor shaft of the gas turbine engine.

5 9. A foil bearing according to claim 7, comprising a plurality of the first foils arranged in the circumferential direction of the shaft, and the foil bearing further comprises a second foil disposed between the shaft and the plurality of first foils and extending in the circumferential direction to have a substantially cylindrical shape.

10 10. A foil bearing for supporting a rotating member that rotates about an axis, comprising:

a stationary mount member surrounding the rotating member so that a gap is defined between the stationary mount member and the rotating member, the stationary mount member having an inner circumferential surface facing the rotating member and
15 an outer circumferential surface opposite to the inner circumferential surface; and

a top foil disposed in the gap between the rotating member and the stationary mount member to support the rotating member via a fluid film when the rotating member rotates, the top foil consisting of a member extending in a circumferential direction to have a substantially cylindrical shape,

20 wherein one end of the top foil is secured to the stationary mount member while the other end of the top foil extends in a radial direction through a slot formed in the stationary mount member at a position near the one end of the top foil to project out from the outer circumferential surface of the stationary mount member,

and wherein the foil bearing further comprises an abutting member which is
25 moveably attached to the stationary member so as to abut a side of the radially

extending portion of the other end of the top foil facing away from the one end of the top foil whereby stiffness of the top foil can be practically adjusted by varying a position at which the abutting member abuts the radially extending portion of the top foil.

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11. A foil bearing according to claim 1, wherein the rotating member comprises a disk-shaped member and the gap is defined between the stationary mount member and a planar surface of the disk-shaped member.

10 12. A foil bearing according to claim 11, wherein the disk-shaped member is provided as a unitary portion of a rotor shaft of a gas turbine engine, and the foil bearing constitutes a thrust bearing of the rotor shaft of the gas turbine engine.